

Indian River Stream Gauge Monitoring

By Geoffrey Smith

Flowing through Sitka National Historical Park (SITK), the Indian River is an important natural resource for the park and for the local community. The river is a biologically rich environment that supports a variety of aquatic resources, including three species of Pacific salmon. The upper Indian River basin is protected in the Tongass National Forest, but intensive suburban development has occurred between the forest and the park. In addition, two diversion structures extract water from the river. A local college maintains the largest diversion, which can take up to 30 cubic feet per second (cfs), to operate a fish hatchery. There is concern that water extraction of this magnitude may harm components of the Indian River aquatic ecosystem.

The NPS responsibility is stated in the park General Management Plan: to “insure that ecological processes and conditions associated with the Indian River...are protected” and “maintain water quality and minimum streamflows needed to sustain the dependent biota of the Indian River, particularly native fish populations” (<http://www.nps.gov/sitk/parkmgmt/planning.htm>). It follows that the primary objective for monitoring Indian River stream flow is to quantify instream flow in the Indian River and to make the data available to those charged with maintaining streamflows and protecting anadromous fish spawning, incubation, and rearing.

Historically, the U.S. Geological Survey (USGS) maintained two Indian River stream gauges. The upper gauge was in the forest above all diversion structures. The second gauge was located just outside the park boundary and below all suburban development and diversion structures. When the USGS discontinued operation of these gauges in 2007, the park entered into a partnership with the City and Borough of Sitka (CBS) and Alaska Department of Fish and Game (ADF&G) to replace both gauges to meet our monitoring objective. ADF&G reestablished streamflow gauge devices near the original sites during the spring of 2007. SEAN, CSB, and ADF&G contributed funds to hire a contractor to process gauge data and to maintain gauge quality control. Data from the gauges has been revealing; in August 2007, as salmon were entering the river to spawn, water diversions between the upper and lower gauges took

50% of the river’s volume 26% of the time. That month, zero days reached ADF&G’s recommended instream flow for spawning salmon in the Indian River. Diversions dropped the river volume below the ADF&G recommendation (61 cfs) 65% of the time in the first 23 days of August 2008. With the gauges in place, park managers now have solid information to share with stakeholders and to ultimately identify a stronger strategy to protect the Indian River ecosystem.



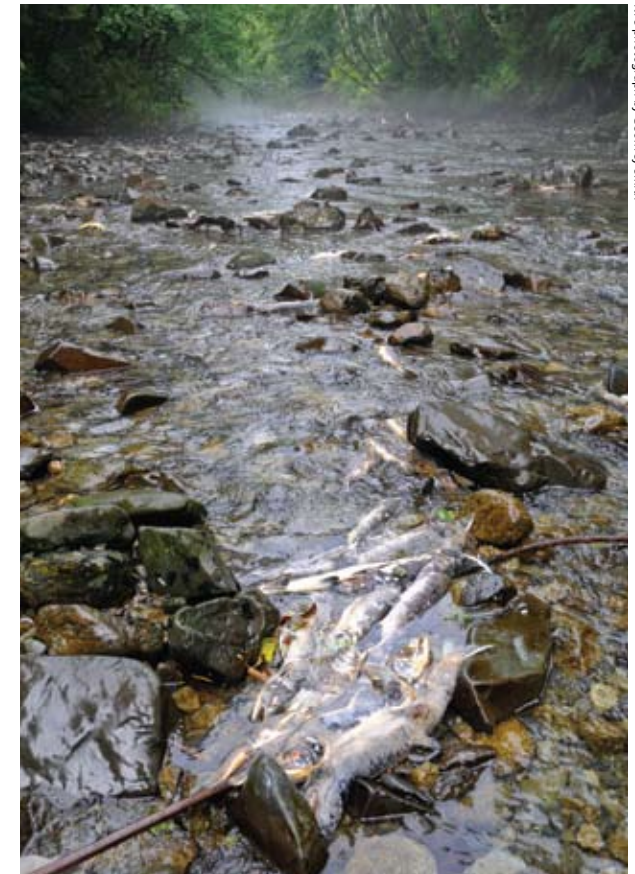
NPS photograph by Geoffrey Smith

Figure 1. Pink salmon running in the Indian River in the park.



NPS photograph by Geoffrey Smith

Figure 2. The water diversion system in the Indian River, upstream from the park.



NPS photograph by Geoffrey Smith

Figure 3. Low water and dead salmon in Sitka National Historical Park’s Indian River.